

Appl. No. 10/796,645
Reply to Office Action of October 18, 2005

Attorney Docket No. 26114.13
Customer No. 27683

Amendments To The Drawings

An attached drawing sheet includes Figures 4 and 5, and replaces the prior sheet that included Figures 4-5. In Figure 4, reference numeral 410 has been added.

Attachment: Replacement Drawing Sheet 4

REMARKS

The specification has been amended, Figure 4 has been amended, and Claims 1, 8-10 and 15 have been amended. Claims 1-31 are pending in the application. This Amendment is accompanied by a Petition for a two-month time extension, and the required extension fee. In view of the foregoing amendments, and the remarks that follow, Applicants respectfully request reconsideration.

Information Disclosure Statement

Pursuant to the duty of disclosure, Applicants are enclosing a Fifth Information Disclosure Statement (IDS). It is assumed that this Amendment and the enclosed IDS will both become available to the Examiner at the same time. However, in the event that this Amendment becomes available before the IDS, then as a courtesy this paragraph will ensure the Examiner is aware that the IDS has been filed and should be considered.

Comment Regarding Power of Attorney

The Power of Attorney for this application does not happen to identify the undersigned attorney. Consequently, in filing this Amendment, the undersigned is acting under the provisions of 37 C.F.R. §1.34.

Objection to Specification

The Office Action objected to the specification, noting that the word "ratio" is misspelled in paragraph [0073], and requiring appropriate correction. The foregoing amendment to the specification corrects this spelling error.

Drawing Amendment

The Office Action objected to the drawings, on the ground that the discussion of Figure 4 in paragraph [0071] uses reference numeral 410, but reference numeral 410 does not appear in the drawings. Reference numeral 410 appeared in Figure 4 of the originally-filed informal drawings, but was inadvertently omitted from the formal drawings that were subsequently filed on July 6, 2004. The foregoing amendments add reference numeral 410 to Figure 4, and Applicants are enclosing a replacement drawing sheet that includes Figure 4.

Independent Claim 1

Independent Claim 1 stands rejected under 35 U.S.C. §103 on the ground that it would be obvious in view of a proposed combination of teachings from O'Connor U.S. Patent No. 6,720,555 and Weller U.S. Patent No. 5,389,784. This ground of rejection is respectfully traversed. In this regard, the PTO specifies in MPEP §2142 that:

The examiner bears the initial burden of factually supporting any *prima facie* conclusion of obviousness. If the examiner does not produce a *prima facie* case, the applicant is under no obligation to submit evidence of nonobviousness.

Applicants respectfully submit that O'Connor and Weller fail to establish a *prima facie* case of obviousness under §103 with respect to Claim 1, for mutually exclusive reasons that are discussed below.

WELLER DOES NOT TEACH WHAT THE OFFICE ACTION SAYS IT DOES

In the paragraph that bridges pages 4-5, the Office Action admits that O'Connor does not disclose a ratio for the sectional area of the magnet bore to the sectional area of the cell volume.

The Office Action therefore turns to Weller, and asserts that Weller discloses such a ratio with a value that meets the limitations of Claim 1. Applicants respectfully disagree.

More specifically, Weller does disclose a Fourier transform ion cyclotron resonance (FT-ICR) mass spectrometer, which can include a superconducting magnet (column 6, lines 45-46), and which has a cell 10 with two sections that are separated by a center trapping plate. The temperature of the magnet bore is not explicitly described. Weller sets forth (in column 6, lines 10-14) a typical diameter for the vacuum chamber 102, and the resulting maximum size for the cell 10.

First, however, a person skilled in the art who was reading Weller (column 2, lines 38-39) would understand that Weller is not referring to the magnet cryostat (vacuum chamber), but in fact is referring to the vacuum chamber in which the cell is located. This skilled person would further understand that the dimension mentioned for this vacuum chamber would not correspond to that of the magnet bore, because Weller considers it desirable to have a magnet cryostat along with radiation baffles, heat insulation, and so forth between the cell vacuum chamber and the inner diameter of the magnet windings. Weller does not set forth a value for the inner diameter of the magnet windings and, in any case, this dimension would need to be greater than the diameter given for the vacuum chamber.

Second, the skilled person would understand that Weller uses the term "cell" to refer to the composite item identified by reference numeral 10. (For example, see 10 in Figure 1, and column 4, lines 61-64). Figure 1 of Weller shows that the item 10 is in fact divided into two chambers. Mass analysis is only carried out in the part of the chamber that is identified by reference numeral 12 (as explained in column 7, lines 31-43). In contrast, the disclosure of the present application uses the term "cell volume" to mean the volume in which mass analysis using FT-ICR takes place. (For example, see the "Background" section of the present application). The "cell" recited in Claim 1 of the present application corresponds functionally to only the part 12 of the chamber in Weller. Weller does not specify a dimension for the part 12 of his chamber,

and in any case this dimension would clearly be smaller than the diameter given for the item 10 (see Figure 1 of Weller).

Accordingly, and contrary to the assertions in the Office Action, Weller does not disclose sufficient dimensional information to teach any specific value for the ratio of the sectional area of the magnet bore to the sectional area of the cell volume. Moreover, the value of this ratio in Weller's system would necessarily be greater than the value theorized by the Examiner. Thus, Weller does not teach what the Office Action says it does. It is therefore respectfully submitted that Weller fails to fulfill its intended role in the §103 rejection, and that the §103 rejection is therefore defective.

A PROPOSED MODIFICATION CANNOT CHANGE A PRINCIPLE OF OPERATION

With respect to the analysis of obviousness under §103, the provisions of MPEP §2143.01 specify that, where an examiner proposes a modification to a reference:

THE PROPOSED MODIFICATION CANNOT CHANGE THE PRINCIPLE OF OPERATION OF A REFERENCE

If the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious.

In the present situation, the Examiner proposes modifying O'Connor in view of Weller. O'Connor discloses an FT-ICR mass spectrometer having a superconducting magnet and a vacuum chamber that are both enclosed in a cooling chamber, such that the magnet bore and the pumping chamber are at the same temperature (4.2°K or lower). In O'Connor, the cooled magnet bore is essential to the operation of O'Connor's system. Applicants respectfully submit that, if a person skilled in the art was starting with the cooled magnet bore of O'Connor, the person would

not have thought it obvious to remove the cooled magnet bore, because the cooled magnet bore is essential to the operation of O'Connor's system. Stated differently, eliminating the cooled magnet bore would change O'Connor's principle of operation, and thus would not be an obvious modification. As specified in MPEP §2143.01, "If the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious". Accordingly, for this independent reason alone, it is respectfully submitted that the proposed modification of O'Connor in view of Weller would not be obvious under §103, and notice to that effect is respectfully requested.

THE PRIOR ART MUST TEACH ALL CLAIM LIMITATIONS UNDER §103

With respect to the analysis of obviousness under §103, the provisions of MPEP §2142 specify that:

To establish a *prima facie* case of obviousness . . . the prior art reference (or references when combined) must teach or suggest all the claim limitations. (Emphasis added).

The PTO considers this requirement to be important, as evidenced by the fact that this exact language appears not only in MPEP §2142, but also in other sections of the MPEP, including MPEP §706.02(j) and MPEP §2143. Applicants' Claim 1 includes a recitation that:

the ratio, R, of the sectional area of the magnet bore to the sectional area of the cell volume . . . is less than 4.25.

The Office Action admits on page 4 that O'Connor does not disclose such a ratio, but asserts that

Weller does disclose such a ratio. However, as discussed above, Weller does not actually disclose a comparable ratio.

Moreover, for reasons discussed above, a person skilled in the art would not remove the cooled magnet bore of O'Connor. Consequently, the person would understand that the dimensions of the magnet bore must be much larger than the dimensions of the vacuum chamber taught by Weller. The skilled person would thus not arrive at a room temperature magnet bore having the specific dimensions specified by Weller. In other words, even when O'Connor and Weller are combined, they fail to satisfy the requirement of MPEP §2142 that their combined teachings must "teach or suggest all the claim limitations" (emphasis added). This in turn means that they fail to properly establish a prima facie case of obviousness. Accordingly, for this independent reason alone, it is respectfully submitted that Claim 1 is not obvious under §103 in view of O'Connor and Weller, and notice to that effect is respectfully requested.

THE PROPOSED MODIFICATION OF O'CONNOR IS NOT PROPER

There is yet another reason why the proposed modification of O'Connor in view of Weller is not proper under §103. In this regard, MPEP §2142 provides that:

To reach a proper determination under §103, the examiner must step backward in time and into the shoes worn by the hypothetical "person of ordinary skill in the art" when the invention was unknown and just before it was made. . . . Knowledge of applicant's disclosure must be put aside in reaching this determination, . . . impermissible hindsight must be avoided, and the legal conclusion must be reached on the basis of the facts gleaned from the prior art.

In addition, the MPEP provides at § 2143.01 that:

The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. . . . Although a prior art device "may be capable of being modified to run the way the apparatus is claimed, there must be a suggestion or motivation in the reference to do so". (Emphasis in original).

In the present situation, the Office Action addresses motivation for the proposed combination of O'Connor and Weller by asserting (at the top of page 5) that:

. . . it would have been obvious to a person of ordinary skill in the art at the time the invention was made to have the ratio of the sectional area of the magnet bore to the sectional area of the cell volume . . . [be] less than 4.25, since it was known in the art to have the radii of the magnetic bore and cell to be sufficiently small.

However, as discussed earlier, a person skilled in the art who was looking to Weller would not actually learn anything about the ratio of the sectional area of the magnet bore to the sectional area of the cell volume. Consequently, since Weller does not teach anything about this ratio, the skilled person looking to Weller would not be motivated to consider adjusting the ratio in O'Connor to any value, much less the specific value recited in Claim 1 (which in any event is not disclosed in Weller). Since the Office Action fails to establish that the prior art would actually motivate a skilled person to implement the specific ratio recited in Claim 1, what the Office Action actually asserts is that the proposed modification of O'Connor to meet Claim 1 would have been well within the ordinary skill of the art. Stated differently, the Office Action is

effectively relying on the level of skill in the art to provide the suggestion to modify O'Connor. However, this approach is directly prohibited by the provisions of MPEP §2143.01, which state that:

FACT THAT THE CLAIMED INVENTION IS WITHIN THE
CAPABILITIES OF ONE OF ORDINARY SKILL IN THE ART
IS NOT SUFFICIENT BY ITSELF TO ESTABLISH *PRIMA
FACIE* OBVIOUSNESS

A statement that modifications of the prior art to meet the claimed invention would have been "'well within the ordinary skill of the art at the time the claimed invention was made'" because the references relied upon teach that all aspects of the claimed invention were individually known in the art is not sufficient to establish a *prima facie* case of obviousness without some objective reason to combine the teachings of the references. [Case citations omitted] . . . (The level of skill in the art cannot be relied upon to provide the suggestion to combine references).

Thus, the approach taken in the Office Action is not permissible, because the level of skill in the art cannot be relied upon to provide the suggestion for modifying teachings of a reference like O'Connor. The present §103 rejection of Claim 1 is therefore not complete, because it fails to demonstrate the motivation that is required by the MPEP. In effect, the §103 rejection is based on hindsight of the present invention, rather than on motivation properly derived from what was known prior to the present invention. In the absence of a proper showing of motivation, the Office Action fails to properly establish a *prima facie* case of obviousness with respect to Claim 1. Accordingly, for this independent reason alone, it is respectfully submitted that Claim 1

is not rendered obvious under §103 by O'Connor and Weller, and notice to that effect is respectfully requested.

In view of the various different reasons discussed above, it is respectfully submitted that Claim 1 is not rendered obvious under §103 by O'Connor and Weller. Claim 1 is therefore believed to be allowable, and notice to that effect is respectfully requested.

Independent Claim 15

Independent Claim 15 stands rejected under 35 U.S.C. §103 on the ground that it would be obvious in view of a proposed combination of teachings from Meek U.S. Patent No. 4,686,365, Horning U.S. Patent Application Publication No. 2004/0217272, and the Weller patent. This ground of rejection is respectfully traversed. In this regard, as noted above, MPEP §2142 specifies that:

The examiner bears the initial burden of factually supporting any *prima facie* conclusion of obviousness. If the examiner does not produce a *prima facie* case, the applicant is under no obligation to submit evidence of nonobviousness.

Applicants respectfully submit that Meek, Horning and Weller fail to establish a *prima facie* case of obviousness under §103 with respect to Claim 15, for mutually exclusive reasons that are discussed below.

WELLER DOES NOT TEACH WHAT THE OFFICE ACTION SAYS IT DOES

As discussed above in association with Claim 1, Weller does not disclose sufficient dimensional information to teach any specific value for the ratio of the sectional area of the magnet bore to the sectional area of the cell volume. Moreover, the value of this ratio in Weller's system would necessarily be greater than the value theorized by the Examiner.

Thus, Weller does not teach what the Office Action says it does. It is therefore respectfully submitted that Weller fails to fulfill its intended role in the §103 rejection, and that the §103 rejection is thus defective.

THE PRIOR ART MUST TEACH ALL CLAIM LIMITATIONS UNDER §103

As noted earlier, when evaluating obviousness under §103, the provisions of MPEP §2142 specify that:

To establish a *prima facie* case of obviousness . . . the prior art reference (or references when combined) must teach or suggest all the claim limitations. (Emphasis added).

The PTO considers this requirement to be important, as evidenced by the fact that this exact language appears not only in MPEP §2142, but also in other sections of the MPEP, including MPEP §706.02(j) and MPEP §2143. Applicants' Claim 15 includes a recitation that:

the ratio, R, of the sectional area of the magnet bore to the sectional area of the cell volume . . . is less than 4.25.

The Office Action admits (in the sentence bridging pages 9-10) that neither Meek nor Horning discloses such a ratio. But then the Office Action goes on to assert that Weller discloses such a ratio. However, for reasons discussed above in association with Claim 1, it is respectfully submitted that Weller does not actually disclose a comparable ratio. In other words, even when Meek, Horning and Weller are combined, they fail to satisfy the requirement of MPEP §2142 that their combined teachings must "teach or suggest all the claim limitations" (emphasis added). This in turn means that they fail to properly establish a *prima facie* case of obviousness. Accordingly, for this independent reason alone, it is respectfully submitted that the proposed

modification of Meek in view of Horning and Weller would not be obvious under §103, and notice to that effect is respectfully requested.

THE PROPOSED MODIFICATION OF MEEK IS NOT PROPER

There is yet another reason why the proposed modification of Meek in view of Horning and Weller is not proper under §103. In this regard, MPEP §2142 provides that:

To reach a proper determination under §103, the examiner must step backward in time and into the shoes worn by the hypothetical "person of ordinary skill in the art" when the invention was unknown and just before it was made. . . . Knowledge of applicant's disclosure must be put aside in reaching this determination, . . . impermissible hindsight must be avoided, and the legal conclusion must be reached on the basis of the facts gleaned from the prior art.

In addition, the MPEP provides at § 2143.01 that:

The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. . . . Although a prior art device "may be capable of being modified to run the way the apparatus is claimed, there must be a suggestion or motivation in the reference to do so". (Emphasis in original).

In the present situation, the Office Action addresses motivation for the proposed combination of Meek, Horning and Weller by asserting that:

. . . it would have been obvious to a person of ordinary skill in the art at the time the invention was made to have the ratio of the sectional area of the magnet bore to the sectional area of the cell volume . . . [be] less than 4.25, since it was known in the art to have the radii of the magnetic more and cell to be sufficiently small.

However, as discussed earlier, a person skilled in the art who was looking to Weller would not actually learn anything about the ratio of the sectional area of the magnet bore to the sectional area of the cell volume. Consequently, since Weller does not teach anything about this ratio, the skilled person looking to Weller would not be motivated to consider adjusting the ratio in Meek to any value, much less the specific value recited in Claim 15 (which in any event is not disclosed in Weller). Since the Office Action fails to establish that the prior art would actually motivate a skilled person to implement the specific ratio recited in Claim 15, what the Office is actually asserting is that the proposed modification of Meek would have been well within the ordinary skill of the art. Stated differently, the Office Action is effectively relying on the level of skill in the art to provide the suggestion to modify Meek. However, this approach is directly prohibited by the provisions of MPEP §2143.01, which state that:

FACT THAT THE CLAIMED INVENTION IS WITHIN THE
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A statement that modifications of the prior art to meet the claimed invention would have been "'well within the ordinary skill of the art at the time the claimed invention was made'" because the

references relied upon teach that all aspects of the claimed invention were individually known in the art is not sufficient to establish a *prima facie* case of obviousness without some objective reason to combine the teachings of the references. [Case citations omitted] . . . (The level of skill in the art cannot be relied upon to provide the suggestion to combine references).

Thus, the approach taken in the Office Action is not permissible, because the level of skill in the art cannot be relied upon to provide the suggestion for modifying teachings of a reference like Meek. The present §103 rejection of Claim 15 is therefore not complete, because it fails to demonstrate the motivation that is required by the MPEP. In effect, the §103 rejection is based on hindsight of the present invention, rather than on motivation properly derived from what was known prior to the present invention. Accordingly, for this independent reason alone, it is respectfully submitted that Claim 15 is not rendered obvious under §103 by Meek, even when considered in combination with Horning and/or Weller.

In view of the various different reasons discussed above, it is respectfully submitted that Claim 15 is not rendered obvious under §103 by Meek, Horning and Weller. Claim 15 is therefore believed to be allowable, and notice to that effect is respectfully requested.

Independent Claim 16

Independent Claim 16 stands rejected under 35 U.S.C. §103 on the ground that it would be obvious in view of a proposed combination of teachings from Meek and Horning. This ground of rejection is respectfully traversed. As noted above, MPEP §2142 specifies that:

The examiner bears the initial burden of factually supporting any *prima facie* conclusion of obviousness. If the examiner does not

produce a *prima facie* case, the applicant is under no obligation to submit evidence of nonobviousness.

Applicants respectfully submit that Meek and Horning fail to establish a *prima facie* case of obviousness under §103 with respect to Claim 16, for mutually exclusive reasons that are discussed below.

MEEK DOES NOT TEACH WHAT THE OFFICE ACTION SAYS IT DOES

At lines 2-5 on page 11, the Office Action asserts that Meek discloses decelerating ions at a location immediately adjacent the front of a measurement cell. However, Applicants respectfully disagree. In more detail, Meek does disclose an FT-ICR mass spectrometer, in which ions are accelerated upstream of a measurement cell, and then are decelerated before entering the measurement cell (column 8, lines 56-58). However, and contrary to the assertions in the Office Action, Meek does not teach that the ions are decelerated immediately adjacent the front of the measurement cell.

In more detail, Meek does teach deceleration of ions before they enter the ICR cell (column 3, lines 59-60), as illustrated in Figure 7. However, Meek points out (column 5, line 16) that Figure 7 is a "schematic illustration". Consequently, a person skilled in the art would not assume that Figure 7 is to scale. Moreover, and even though Figure 7 is schematic, Figure 7 clearly and unambiguously shows that there is a gap between the deceleration lens 86 and the ICR cell 87. Meek does not teach anything about the size of this gap (especially in light of the fact that Figure 7 is not to scale). Consequently, all that Meek really teaches a skilled person is that there is a gap of some significant length between the deceleration lens and the measurement cell.

Accordingly, and contrary to the assertions in the Office Action, Meek does not disclose deceleration of ions immediately before a measurement cell. Meek thus does not teach what the

Office Action says it does. It is therefore respectfully submitted that Meek fails to fulfill its intended role in the §103 rejection, and that the §103 rejection is therefore defective.

THE PRIOR ART MUST TEACH ALL CLAIM LIMITATIONS UNDER §103

With respect to the analysis of obviousness under §103, and as noted earlier, the provisions of MPEP §2142 specify that:

To establish a *prima facie* case of obviousness . . . the prior art reference (or references when combined) must teach or suggest all the claim limitations. (Emphasis added).

The PTO considers this requirement to be important, as evidenced by the fact that this exact language appears not only in MPEP §2142, but also in other sections of the MPEP, including MPEP §706.02(j) and MPEP §2143. Applicants' Claim 16 includes a recitation that:

. . . the power supply is configured to . . . decelerate the said ions at a location only immediately adjacent the front of the measurement cell, and downstream of the front face of the magnet.

However, as discussed above, Meek does not teach deceleration of ions immediately adjacent a measurement cell. The §103 rejection also relies on Horning, but for other teachings. In particular, the Office Action asserts that Horning discloses an ion guiding arrangement, but does not indicate that Horning discloses ion deceleration immediately adjacent a measurement cell. Consequently, even when the indicated teachings from Meek and Horning are combined, they fail to satisfy the requirement of MPEP §2142 that their combined teachings must "teach or suggest all the claim limitations" (emphasis added). And that in turn means the Office Action fails to properly establish a *prima facie* case of obviousness. Therefore, for this independent

reason alone, it is respectfully submitted that Claim 16 is not obvious under §103 in view of Meek and Horning, and notice to that effect is respectfully requested.

In view of the various different reasons discussed above, it is respectfully submitted that Claim 16 is not rendered obvious under §103 by Meek and Horning. Claim 16 is therefore believed to be allowable, and notice to that effect is respectfully requested.

Independent Claim 27

Independent Claim 27 stands rejected under 35 U.S.C. §103 on the ground that it would be obvious in view of a proposed combination of teachings from Meek and Horning. This ground of rejection is respectfully traversed, for the following reasons. Claim 27 includes a recitation of:

. . . decelerating the ions at a location only immediately upstream of the measurement cell . . .

The rationale given in the Office Action for the rejection of Claim 27 is the same rationale given for the rejection of Claim 16. For the same basic reasons discussed above in association with Claim 16, Applicants respectfully submit that Claim 27 is not rendered obvious under §103 by Meek and Horning. Claim 27 is therefore believed to be allowable, and notice to that effect is respectfully requested.

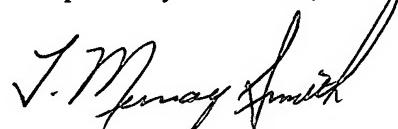
Dependent Claims

Claims 2-14, Claims 17-26 and Claims 28-31 respectively depend from Claim 1, Claim 16 and Claim 27, and are also believed to be distinct from the art of record, for example for the same reasons discussed above with respect to Claims 1, 16 and 27, respectively.

Conclusion

Based on the foregoing, it is respectfully submitted that all of the pending claims are fully allowable, and favorable reconsideration of this application is therefore respectfully requested. If the Examiner believes that examination of the present application may be advanced in any way by a telephone conference, the Examiner is invited to telephone the undersigned attorney at 972-739-8647.

Respectfully submitted,



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Enclosures: Replacement Drawing Sheet 4
Petition for Time Extension
Fifth Information Disclosure Statement, with
Form PTO-1449 and copies of cited documents
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